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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,967	02/06/2004	Sergei Kolomeitsev	VAL 183 P2	7346

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EXAMINER
PRESTON, ERIK D

ART UNIT	PAPER NUMBER
2834	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/773,967	Applicant(s) KOLOMEITSEV ET AL.	
	Examiner Erik D. Preston	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2007.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 12-14, 16-21 and 31 is/are pending in the application.
4a) Of the above claim(s) 13, 14 and 16-21 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-8, 12 and 31 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 13, 14 & 16-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/17/2007.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1 & 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoemann et al (US 2002/0163275, previously cited) in view of Okazaki et al. (US 2002/0175574).

With respect to claim 1, Hoemann teaches a stator for an electric motor (Fig. 6, #10) comprising: a radial array of 2N (N=9) substantially identical teeth, definable as 1, 2, 3, to 2N; N coils (Fig. 6, #14), one wound around each even tooth; and no coil wound around any odd tooth, wherein likelihood of phase-to-phase shorting is reduced, compared with an electric motor having different phases in a common slot (which is inherently true), thereby reducing vibration and mitigating increased steering effort, both of which can accompany phase-to-phase shorting, but it does not teach a vehicle which includes a steering assist system which is powered by the electric motor. However, Okazaki teaches a vehicle which includes a steering assist system which is powered by an electric motor (Paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the stator of Hoemann in the motor as

taught by Okazaki because it provides a stator with an increased magnetic flux that has a decreased risk of phase-to-phase arcing (Hoemann, Col. 5, Lines 44-66).

With respect to claim 31, Hoemann in view of Okazaki teaches the apparatus of claim 1, and Hoemann teaches that the coils provide multiple phases.

Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho (US 5723930, previously cited) in view of Okazaki et al. (US 2002/0175574).

With respect to claim 2, Ho teaches a stator (Fig. 3, #100) for an electric motor, comprising: a first group of stator teeth, each acting as a magnetic core for a single coil wound around it; and carrying substantially all magnetic flux of the coil wound around it; and a second group of stator teeth, identical in structure to the first group of stator teeth, having no coils wound around them (as seen in Fig. 3) wherein likelihood of phase-to-phase shorting is reduced, compared with an electric motor having different phases in a common slot (which is inherently true), thereby reducing vibration and mitigating increased steering effort, both of which can accompany phase-to-phase shorting, but it does not teach a vehicle which includes a steering assist system which is powered by the electric motor. However, Okazaki teaches a vehicle which includes a steering assist system which is powered by an electric motor (Paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the stator of Ho in the motor of Okazaki because it provides a simple winding mode that eliminates the cogging phenomena of a motor (Ho, Abstract).

With respect to claim 3, Ho teaches the stator of claim 2, wherein slots (Fig. 3, #200) are present between adjacent teeth, and some slots contain no coils (as seen in Fig. 3).

With respect to claims 4 & 6, Ho teaches a stator for an electric motor, comprising: a radial array of stator teeth, separated by stator slots; and phase coils encircling at least some stator teeth, wherein no slot contains coils from more than one phase, and any slot containing a coil is fully occupied by said coil (Col. 4, Lines 26 & 27) wherein likelihood of phase-to-phase shorting is reduced, compared with an electric motor having different phases in a common slot (which is inherently true), thereby reducing vibration and mitigating increased steering effort, both of which can accompany phase-to-phase shorting, but it does not teach a vehicle which includes a steering assist system which is powered by the electric motor. However, Okazaki teaches a vehicle which includes a steering assist system which is powered by an electric motor (Paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the stator of Ho in the motor of Okazaki because it provides a simple winding mode that eliminates the cogging phenomena of a motor (Ho, Abstract).

It is further noted that, even if Ho did not explicitly teach a singular coil fully occupying any slot containing the coil, it would have been obvious to combine any number of coils of the same phase in a single slot into a single integral coil since it has been held that "the use of a one piece construction...would be merely a matter of

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obvious engineering choice.” (In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965)).

With respect to claim 5, Ho teaches the apparatus of claim 4, wherein the radial array of stator teeth comprises at least two teeth (as seen in Fig. 3).

With respect to claim 7, Ho teaches an apparatus, comprising a stator for an electric motor, comprising coil slots; a rotor (which inherently exists); coils in respective slots, which fully occupy the respective slots, wherein all currents in any slot are in-phase (as seen in Fig. 3), wherein likelihood of phase-to-phase shorting is reduced, compared with an electric motor having different phases in a common slot (which is inherently true), thereby reducing vibration and mitigating increased steering effort, both of which can accompany phase-to-phase shorting, but it does not teach a vehicle which includes a steering assist system which is powered by the electric motor. However, Okazaki teaches a vehicle which includes a steering assist system which is powered by an electric motor (Paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the stator of Ho in the motor of Okazaki because it provides a simple winding mode that eliminates the cogging phenomena of a motor (Ho, Abstract).

With respect to claim 8, Ho teaches the apparatus of claim 7, wherein no currents in any slot have different phases.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 2002/0163275, previously cited) in view of Okuzaki et al. (US 2002/0175574). Hsu teaches a stator (Fig. 7A) for an electric motor comprising: an outer rim (Fig. 7A, #51); stator teeth (Fig. 7A, #41) extending radially inward from the rim; breaks (Fig. 7A, #512) in the stator, which allow any selected individual stator tooth to be removed from the stator; and a pre-formed coil (as seen in Fig. 5, #31) to be mounted onto the selected stator tooth, but it does not teach a vehicle which includes a steering assist system which is powered by the electric motor. However, Okazaki teaches a vehicle which includes a steering assist system which is powered by an electric motor (Paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the stator of Hsu in the motor of Okazaki because it provides a motor with a higher efficiency and operating speed (Hsu, Abstract).

Response to Arguments

Applicant's arguments with respect to claims 1-8, 12 & 31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik D. Preston whose telephone number is (571)272-8393. The examiner can normally be reached on Monday through Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)272-2044. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



05/10/2007



BURTON MULLINS
PRIMARY EXAMINER